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EXAMINER

WALCK, BRIAN D

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|---------------------------------------|--|
| Office Action Summary | Application No. 10/581,578 | Applicant(s) HAYASHI ET AL. | |
| | Examiner Brian Walck | Art Unit 1793 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 August 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30,31 and 33-49 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 30,31 and 33-49 is/are rejected.
- 7) ☒ Claim(s) 45-49 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Claims

1. Claims 1-29 and 32 are canceled. Claims 30-31 and 33-49 are pending where claims 30-31 and 33-49 have been amended.

Status of Previous Rejections

2. The previous 35 USC § 102 and § 103 rejections of the claims have been withdrawn in view of amendments to the claims.
3. The previous 35 USC § 112 rejections of the claims have been maintained.

Claim Objections

4. **Claims 45, 46, 47, 48, and 49 are objected to** under 37 CFR 1.75 as being a substantial duplicate of claims 30, 31, 33, 40, and 38, respectively. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 112

35 USC § 112 First paragraph New Matter

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. **Claims 30-31 and 33-49 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.** The claim(s) contains

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subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The limitations “a carbon material adsorbing nitrate nitrogen or a fluoride ion through ion exchange with a chloride ion” and “for combining with a carbide, a chloride ion-exchanging with one of a nitrate nitrogen, a nitrite nitrogen and a fluoride ion via calcium” in claims 30 and 45 is new matter that is not present neither in the originally filed specification nor the originally presented claims. Claims 31, 33-44, and 46-49 contain new matter because they are dependent on claims 30 and 45.

35 USC § 112 First paragraph Scope of Enablement

7. **Claims 30-31 and 33-49 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for producing an anion adsorbing carbon material, does not reasonably provide enablement for producing an anion adsorbing carbon material wherein the carbonizing of the raw plant material is performed **without any activation** of the carbon for increasing a physical adsorption effective area as claimed.**

Attention is directed to *In re Wands*, 8 USPQ 1400 (CAFC 1988) at 1404 (CAFC 1988) at 1404 where the court set forth the eight factors to consider when assessing if a disclosure would have required undue experimentation. Citing *Ex parte Forman*, 230 USPQ 546 (BdApl) at 547 the court recited eight factors:

- 1) *The nature of the invention:*

The instant invention is drawn to a method of producing an anion adsorbing carbon material wherein a raw plant material is brought into a solution of calcium hydroxide (referred to by applicant as lime water or milk of lime) contact with a solution containing calcium ions, the raw plant material is carbonized, and the carbonized material is contacted with an acid solution. The instant claims recite that the carbonizing of the plant material is performed without **any** activation of the carbon for increasing a physical adsorption effective area.

2) *The state of the prior art:*

The state of the art recognizes that a carbon material treated with calcium chloride, calcium acetate, or calcium hydroxide will be activated upon carbonization.

For example: US 3,168,485 discloses that activated carbon can be prepared by the carbonization of carbonaceous materials impregnated with calcium hydroxide; US 3,835,064 discloses that activated carbon can be prepared by carbonization of carbonaceous materials impregnated with calcium hydroxide; US 4,937,223 discloses that ligneous material can be activated by carbonization in the presence of calcium hydroxide; EP 1103523 A2 discloses that calcium hydroxide acts as an activation agent for carbonaceous material.

The prior art discloses that the carbonization can be done in a variety of different atmospheres and temperatures and activated carbon

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will still result if calcium hydroxide is present with the carbon-containing material during carbonization.

3) *The relative skill of those in the art:*

The relative skill of those in the art is presumed to be extremely high and extremely credible as US patents have been issued on the subject for over 75 years.

4) *The predictability of the art:*

The prior art suggests that activated carbon can be very consistently and predictably achieved by treating a carbon-containing material with a calcium hydroxide prior to carbonization.

5) *The breadth of the claims:*

Applicant's assertion that the process claimed would be able to produce non-activated carbon does not commensurate with the scope of the objective enablement, especially in view of the limited working examples.

6) *The amount of guidance/working examples:*

The specification contains no guidance as to how to carry out carbonization of a carbon-containing previously treated with an activating agent (i.e. calcium acetate, calcium chloride, or calcium hydroxide) without any activation of the carbon. The only reference to the notion that the carbonization of the material will occur without activation is in reference to figures 1, 2, 3, 4. Applicant states that figures 1-4 show a carbonization

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furnace that can carbonize a ligneous material without activation, and also states that metal chloride impregnated carbon chips are fed to that furnace to be carbonized by activation. Applicant does not disclose or imply how said furnace is capable of achieving this. Applicant states that the carbonization is conducted at a temperature between 650°C and 750°C, which is a temperature which causes activation in the prior art.

Furthermore, in applicant's remarks filed 8/03/2009, applicant points to data (see Table 1, page 10 of the remarks filed 8/03/2009) collected from experiments performed under largely undisclosed conditions that applicant alleges show that the present invention is subjected to carbonization without being activated in the sense of increasing a physical adsorption effective area. However, the data clearly shows that when the carbonaceous material is brought from 600 °C to within applicant's disclosed carbonization temperature of 700 °C the surface area of the material labeled "Present invention" increases, thus there is some activation of the material for increasing a physical adsorption effective area. The fact that it increases less than some other experiment performed under undisclosed conditions is irrelevant.

7) *Quantization of undue experimentation.*

The prior art states that activation will occur when a carbonaceous material is impregnated with calcium hydroxide then subjected to carbonization. Furthermore, data disclosed by applicant in the remarks

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filed 8/03/2009 show that an increase in surface area (i.e. activation) occurs when the applicant's "present invention" is brought to a carbonization temperature.

One of ordinary skill in the art would be burdened with undue "painstaking experimentation study" to determine how to carbonize a carbon material impregnated with calcium hydroxide without any activation of the carbon material occurring.

35 USC § 112 Second Paragraph

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 30-31 and 33-49 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claim(s) are replete with indefinite and functional or operational language. The structure which goes to make up the device must be clearly and positively specified. The structure must be organized and correlated in such a manner as to present a complete operative device. Examples of indefiniteness issues follow.

Claims 30 and 45 recites the phrase "applying a hydrochloric acid solution to the carbon material for combining with a carbide, a chloride ion-exchanging with one of a nitrate nitrogen, a nitrite nitrogen and a fluoride ion via calcium." This limitations is indefinite because it is unclear what limitations, if any, this phrase confers to the claims

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beyond applying a hydrochloric acid solution to the carbon material. Claims 31, 33-44, and 46-49 are indefinite for being dependent on claims 30 and 45.

Furthermore, claims 30 and 45 recite the limitation "without any activation of the carbon for increasing a physical adsorption effective area." Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). Applicant argues in the remarks filed 8/03/2009 that the term "without any activation of the carbon for increasing a physical adsorption effective area" in claims 30 and 45 is used by the claim to mean "the resulting intermediate product can have a reduced specific surface area under the respective temperature conditions as defined in our specification, compared with the material to which calcium has not been introduced and is not activated", while the accepted meaning is that there is no increase in the physical surface area upon carbonization. The term is indefinite because the specification does not clearly redefine the term.

Furthermore, claims 34-36 recite the limitation "the solution." This limitation is indefinite because it is unclear whether this refers to the acid solution or the solution of one of lime water and milk of lime.

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Furthermore, claims 40 and 48 recite the limitation "The manufacturing method for the carbon material of Claim 30 (or 45) is neutralized after the applying of an acid solution." This limitation is indefinite because it does not state what is neutralized.

Furthermore, claim 42 recites the limitation that the calcium ions are provided within one of a calcium chloride solution and a calcium acetate solution. However, this limitation is indefinite because it contradicts instant claim 30 which states that the calcium ions are provided within one of lime water and milk of lime.

Furthermore, claim 45 recites the limitation "with calcium ions adhered to the where the carbonizing of the raw plant material is performed." This limitation does not make any sense as an English phrase.

Claim Rejections - 35 USC § 102/103

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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12. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

14. Claims 30-31, 33-35, 37-39, 41, 43, 45-47 and 49 are rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over the article titled "Adsorption of Fluorine and Nitrate Ions by Charcoal" by Yokoyama et al (cited by applicant in IDS; the English language translation provided by applicant has been relied upon for examination purposes).

Regarding claim 30 and 45, Yokoyama discloses a manufacturing method for a carbon material comprising: providing a solution of calcium hydroxide (i.e. lime water or

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milk of lime) including calcium ions that are brought into contact with a material comprising plant material; carbonizing the plant material with the calcium ions; and applying a hydrochloric acid solution to the carbonized plant material. (Yokoyama, "Experimental")

Yokoyama does not explicitly disclose that the manufacturing method is for "a carbon material adsorbing nitrate nitrogen, nitrite nitrogen or a fluoride ion through ion exchange with a chloride ion" or that "where the carbonizing of the plant material is performed without any activation of the carbon for increasing a physical adsorption effective area" or that applying the hydrochloric acid solution is "for combining with a carbide, a chloride ion for ion-exchanging with one of a nitrate nitrogen, a nitrite nitrogen and a fluoride ion via calcium." However, the disclosed action steps of Yokoyama are the same as the instantly claimed action steps. Where the claimed and prior art products are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established (see MPEP 2112.01 [R-3].) In the instant case, the carbon material of Yokoyama would be expected to have the same or similar properties as the instantly claimed carbon material because the disclosed method steps of Yokoyama are the same as the instantly claimed method steps. Therefore, a rejection based alternatively on either 35 U.S.C. 102(b) or 35 U.S.C. 103(a) is eminently fair and acceptable.

Regarding claim 31 and 46, Yokoyama discloses that after the plant material is brought into contact with the calcium hydroxide, the plant material is left in a crucible

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(Yokoyama, "Experimental"). The plant material would dry to some degree in said crucible before carbonization of the plant material.

Regarding claim 33 and 47, Yokoyama discloses that the carbonization is performed at 700 °C (Yokoyama, "Results and Discussion"), within the instantly claimed range of 650 °C to 750 °C.

Regarding claim 34, Yokoyama discloses that the acid solution is HCl (Yokoyama, "Experimental").

Regarding claim 35, Yokoyama discloses that the concentration of the HCl is 1 mol/L (Yokoyama, "Experimental"), within the instantly claimed range of 0.01 mol/L to 20 mol/L.

Regarding claim 37, the carbon material of Yokoyama would inherently be cooled upon removal from the carbonization furnace.

Regarding claim 38 and 49, Yokoyama discloses that the carbon material is wood chips (Yokoyama, "Experimental"), which are a ligneous material.

Regarding claim 39, the carbon material of Yokoyama is wood chips (Yokoyama, "Experimental"), which are grains or pellets.

Regarding claim 41, the solution of Yokoyama is 10 wt% calcium hydroxide (Yokoyama, "Experimental") falling within the instantly claimed range of at least 5% weight of calcium ions.

Regarding claim 43, the anions of the object of adsorption of Yokoyama are nitrates and fluorides (Yokoyama, title).

Claim Rejections - 35 USC § 103

15. Claims 30-31, 33-41, 43 and 45-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2003/0179437 A1 to Tanaka et al.

Regarding claim 30 and 45, Tanaka discloses a manufacturing method for a carbon material comprising: providing a solution of an alkali hydroxide including calcium ions that are brought into contact with a material comprising plant material; carbonizing the plant material with the alkali ions; and applying a hydrochloric acid solution to the carbonized plant material (Tanaka, page 8, para [0116]).

Tanaka differs from the instant claims in that the alkali hydroxide of the specifically disclosed example of Tanaka is potassium hydroxide instead of calcium hydroxide. However, Tanaka discloses that calcium hydroxide can be used instead of potassium hydroxide (Tanaka, page 5-6, para [0082]). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute calcium hydroxide for potassium hydroxide in the specific example of Tanaka. The motivation for doing so is that Tanaka explicitly states that calcium hydroxide can be substituted for potassium hydroxide as the alkali agent in the process (Tanaka, pages 5-6, para [0082]).

Tanaka does not explicitly disclose that the manufacturing method is for “a carbon material adsorbing nitrate nitrogen, nitrite nitrogen or a fluoride ion through ion exchange with a chloride ion” or that “where the carbonizing of the plant material is performed without any activation of the carbon for increasing a physical adsorption effective area” or that applying the hydrochloric acid solution is “for combining with a

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carbide, a chloride ion for ion-exchanging with one of a nitrate nitrogen, a nitrite nitrogen and a fluoride ion via calcium.” However, the disclosed action steps of Tanaka are the same as the instantly claimed action steps. Where the claimed and prior art products are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established (see MPEP 2112.01 [R-3].) In the instant case, the carbon material of Tanaka would be expected to have the same or similar properties as the instantly claimed carbon material because the disclosed method steps of Tanaka are the same as the instantly claimed method steps.

Regarding claim 31 and 46, Tanaka discloses that after the plant material is brought into contact with the alkali hydroxide, the plant material is left in a crucible and heated slowly to the carbonization temperature (Tanaka, page 8, para [0116]). The heating of the plant material would cause the plant material to dry to some degree in said crucible before carbonization of the plant material.

Regarding claim 33 and 47, Tanaka discloses that the carbonization is performed at 700 °C (Tanaka, page 8, para [0116]), within the instantly claimed range of 650 °C to 750 °C.

Regarding claim 34, Tanaka discloses that the acid solution is HCl (Tanaka, page 8, para [0116]).

Regarding claim 35, Tanaka discloses that the concentration of the HCl is 1 N (Tanaka, page 8, para [0116]), within the instantly claimed range of 0.01 mol/L to 20 mol/L.

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Regarding claim 36, although Tanaka does not disclose the pressure at which the acid treatment occurs, one of ordinary skill in the art would be able to vary the pressure and determine the optimal pressure for the process via routine experimentation. “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Regarding claim 37, the carbon material of Yokoyama would inherently be cooled upon removal from the carbonization furnace.

Regarding claim 38 and 49, Tanaka discloses that the carbon material is coal pitch (Tanaka, page 8, para [0116]), which is a ligneous material.

Regarding claim 39, Tanaka discloses that the dried carbon material can be formed into small disks (i.e. pellets) (Tanaka, page 8, para [0112]).

Regarding claim 40 and 48, it is unclear what claim 40 and 48 is claiming is neutralized, but it would be obvious to one of ordinary skill in the art at the time the invention was made to neutralize the used acid solution because in many processes acid solution is commonly neutralized after being used to minimize hazardous waste of the process.

Regarding claim 41, the ratio of the mass of the alkali hydroxide of the solution of Tanaka to the carbon material of Tanaka is 2.5. This appears to fall within the instantly claimed range of at least 5% weight of calcium ions. Alternatively, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or

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temperature is critical. “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). See MPEP 2144.05 [R-5]. In the instant case, it would require little more than routine experimentation to determine the optimal weight percent of alkali to add in the method of Tanaka.

Regarding claim 43, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In the instant case, it is expected that the carbon material product of Tanaka would be able to adsorb nitrates and fluorides.

16. Claims 30-31, 33-43 and 45-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 1103523 A2 to Iwasaki et al.

Regarding claim 30 and 45, Iwasaki discloses a manufacturing method for a carbon material comprising: providing a solution of an alkali hydroxide including calcium ions that are brought into contact with a material comprising plant material; carbonizing the plant material with the alkali ions; and applying a hydrochloric acid solution to the carbonized plant material (Iwasaki, column 6, para [0027-0028]).

Iwasaki differs from the instant claims in that the alkali hydroxide of the specifically disclosed example of Iwasaki is potassium hydroxide instead of calcium hydroxide. However, Iwasaki discloses that calcium hydroxide can be used instead of

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potassium hydroxide (Iwasaki, column 3, para [0016]). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute calcium hydroxide for potassium hydroxide in the specific example of Iwasaki. The motivation for doing so is that Iwasaki explicitly states that calcium hydroxide can be substituted for potassium hydroxide as the alkali agent in the process (Iwasaki, column 3, para [0016]).

Iwasaki does not explicitly disclose that the manufacturing method is for “a carbon material adsorbing nitrate nitrogen, nitrite nitrogen or a fluoride ion through ion exchange with a chloride ion” or that “where the carbonizing of the plant material is performed without any activation of the carbon for increasing a physical adsorption effective area” or that applying the hydrochloric acid solution is “for combining with a carbide, a chloride ion for ion-exchanging with one of a nitrate nitrogen, a nitrite nitrogen and a fluoride ion via calcium.” However, the disclosed action steps of Iwasaki are the same as the instantly claimed action steps. Where the claimed and prior art products are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established (see MPEP 2112.01 [R-3].) In the instant case, the carbon material of Iwasaki would be expected to have the same or similar properties as the instantly claimed carbon material because the disclosed method steps of Tanaka are the same as the instantly claimed method steps.

Regarding claim 31 and 46, Iwasaki discloses that after the plant material is brought into contact with the alkali hydroxide, the plant material is left in a reactor and heated slowly to the carbonization temperature (Iwasaki, column 6, para [0027-0028]).

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The heating of the plant material would cause the plant material to dry to some degree in said reactor before carbonization of the plant material.

Regarding claim 33 and 47, Iwasaki discloses that the carbonization is performed at 700 °C (Iwasaki, column 6, para [0027-0028]), within the instantly claimed range of 650 °C to 750 °C.

Regarding claim 34, Iwasaki discloses that the acid solution is HCl (Iwasaki, column 6, para [0027-0028]).

Regarding claim 35, Iwasaki discloses that the concentration of the HCl is 10% (Iwasaki, column 6, para [0027-0028]), which appears to fall within the instantly claimed range of 0.01 mol/L to 20 mol/L.

Regarding claim 36, although Iwasaki does not disclose the pressure at which the acid treatment occurs, one of ordinary skill in the art would be able to vary the pressure and determine the optimal pressure for the process via routine experimentation. “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Regarding claim 37, the carbon material of Iwasaki would inherently be cooled upon removal from the carbonization furnace.

Regarding claim 38 and 49, Iwasaki discloses that the carbon material is coal pitch (Iwasaki, column 6, para [0027-0028]), which is a ligneous material.

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Regarding claim 39, Iwasaki discloses that the dried carbon material can be formed into granules and particulates (i.e. grains or pellets) (Iwasaki, column 3, para [0013]).

Regarding claim 40 and 48, it is unclear what claim 40 and 48 is claiming is neutralized, but it would be obvious to one of ordinary skill in the art at the time the invention was made to neutralize the used acid solution because in many processes acid solution is commonly neutralized after being used to minimize hazardous waste of the process. Furthermore, Iwasaki discloses neutralizing a mixture with an acid (Iwasaki, column 6, para [0027]).

Regarding claim 41, Iwasaki discloses that the alkali hydroxide solution is 85% (Iwasaki, column 6, para [0027-0028]), which falls within the instantly claimed range of at least 5% weight of calcium ions.

Regarding claim 42, Iwasaki discloses that calcium chloride can be used as the alkali agent (Iwasaki, column 3, para [0015])

Regarding claim 43, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In the instant case, it is expected that the carbon material product of Iwasaki would be able to adsorb nitrates and fluorides.

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17. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over EP 1103523 A2 to Iwasaki et al as applied to claims 30-31, 33-43 and 45-49 above, and further in view of US 3,168,485 to Knobloch et al (cited in previous office action).

Iwasaki describes a process of preparing an anion adsorbing carbon material as described above. Iwasaki fails to explicitly disclose that anion adsorbing carbon material is treated with a solution of NaCl or KCl.

Knobloch discloses that calcium chloride or sodium chloride can be added after pyrolytic treatment of a carbonaceous material for the preparation of activated carbon to improve the absorptive capacity of the carbon (Knobloch, column 1, lines 61-71).

Regarding claim 44, it would be obvious to one of ordinary skill in the art at the time the invention was made to take the anion adsorbing carbon material made by the process of Iwasaki and expose the carbon material to NaCl or KCl as taught by Knobloch. The motivation for doing so would be to improve the absorptive capacity of the carbon.

Response to Arguments

18. Applicant's arguments filed 8/03/2009 have been fully considered but they are not persuasive.

In applicant's remarks filed 8/03/2009, applicant points to data (see Table 1, page 10 of the remarks filed 8/03/2009) collected from experiments performed under largely undisclosed conditions that applicant alleges show that the present invention is subjected to carbonization without being activated in the sense of increasing a physical adsorption effective area. However, the data clearly shows that when the

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carbonaceous material is brought from 600 °C to within applicant's disclosed carbonization temperature of 700 °C the surface area of the material labeled "Present invention" increases, thus there is some activation of the material for increasing a physical adsorption effective area. The fact that it increases less than some other experiment performed under undisclosed conditions is irrelevant. Furthermore, applicant has not acknowledged or contested the fact that the prior art regards calcium hydroxide as an activation agent, or how applicant is capable of introducing calcium hydroxide into a carbonaceous material, carbonizing the carbonaceous material and producing a material without any activation of the carbon material.

Applicant argues in the remarks filed 8/03/2009 that the term "without any activation of the carbon for increasing a physical adsorption effective area" in claims 30 and 45 is used by the claim to mean "the resulting intermediate product can have a reduced specific surface area under the respective temperature conditions as defined in our specification, compared with the material to which calcium has not been introduced and is not activated." This is not a reasonable interpretation of said limitation, nor does the specification clearly redefine the term. "Without **any** activation of the carbon for increasing a physical adsorption effective area" means exactly that- that there is no increase in the physical surface area of the carbon material upon carbonizing the carbon material. Applicant's own data shows that this is not the case (see the above paragraph), nor would this be expected based upon the art cited in the above 35 USC 112 1st paragraph rejection.

Conclusion

19. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Walck whose telephone number is (571)270-5905. The examiner can normally be reached on Monday-Friday 9 AM-6:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571)272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Brian Walck/
Examiner, Art Unit 1793
/Scott Kastler/
Primary Examiner, Art Unit 1793